

THE AGARICACEAE OF TROPICAL NORTH AMERICA—III

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The introductory remarks used in the last article of this series apply in a general way to the genera here treated; most of them belong to temperate regions and are scantily represented in the tropics except at high elevations. The genus *Hydrocybe* seems to delight in the moist mountain tops where tree-ferns grow, and a number of endemic species have been developed in these peculiar and segregated localities. It was my good fortune to be admirably situated at Cinchona, Jamaica, at 5,000 feet elevation, for the study of many species of this genus, and to have Mrs. Murrill with me to make colored drawings from the freshly gathered specimens.

The following simple key may be used to distinguish these genera. They all contain fleshy, central-stemmed species, but none of them possess a volva and only two are furnished with the rudiments of an annulus. The temperate species far exceed those of the tropics, both in number and abundance.

Lamellae fleshy, not waxy, though apparently so in *Laccaria*.

Lamellae adnate; spores echinulate.

1. LACCARIA.

Lamellae decurrent.

Sporophore solitary or gregarious.

2. CLITOCYBE.

Sporophore densely cespitose.

3. MONADELPHUS.

Lamellae sinuate or adnexed.

4. MELANOLEUCA.

Lamellae waxy at maturity, translucent or watery in appearance.

Veil absent; pileus usually bright-colored.

5. HYDROCYBE.

Veil present; pileus not bright-colored.

6. HYGROPHORUS.

1. LACCARIA Berk. & Br. Ann. Nat. Hist. 370. 1883

Russuliopsis Schröt. Krypt. Fl. Schles. 3¹: 622. 1889.

This genus is distinguished from *Clitocybe* by its echinulate spores and adnate gills.

LACCARIA LACCATA (Scop.) Berk. & Br.
Ann. Nat. Hist. 370. 1883

Clitocybe laccata Quél. Champ. Jura Vosg. 55. 1872.

No attempt is here made to list the synonyms of this common and well-known temperate species, which is probably confined to the higher elevations of our tropics, being abundant at Cinchona, Jamaica.

Cinchona, Jamaica, *W. A. & Edna L. Murrill* 547, 599; Cuba, *Wright*; Jalapa, Mexico, *W. A. & Edna L. Murrill* 2.

2. CLITOCYBE (Fries) Quél. Champ. Jura Vosg. 48. 1872

The distinguishing feature of this very important temperate genus is its decurrent gills. Some of the species, however, do not show this character very conspicuously.

1. *Clitocybe niveicolor* sp. nov.

Entire sporophore snowy-white, gregarious in moist humus; pileus compressed-convex, reaching 7 mm. in diameter; surface smooth, glabrous, appearing subtomentose when dry because of the loosely woven context, margin slightly irregular, decurved; lamellae decurrent, distant, slightly arcuate; spores ovoid, smooth, hyaline, $12 \times 7\mu$; stipe cylindric, slightly tapering upward, glabrous, fleshy, fistulose, 1-1.5 cm. long, 1 mm. thick above, 1.5 mm. below.

Type collected on the ground in a moist virgin forest covering a mountain side near Motzorongo, Mexico, 1,000 ft. elevation, January 15, 1910, *W. A. & Edna L. Murrill* 1058.

3. *Clitocybe troyana* sp. nov.

Pileus subhemispheric, regular, solitary, 1 cm. broad; surface dry, smooth, glabrous, pale-isabelline; margin regular, concolorous, incurved on drying; lamellae decurrent, rather crowded, white; spores ovoid, smooth, hyaline, $5 \times 4\mu$; stipe straight, tapering upward, subconcolorous, glabrous, 2.5 cm. long, 1-1.5 mm. thick.

Type collected on the ground in woods, Troy and Tyre, Jamaica, January 12-14, 1909, *W. A. Murrill & W. Harris* 931.

4. *Clitocybe incrustata* sp. nov.

Pileus turbinate, with conic umbo, solitary, 2 cm. broad, nearly 1 cm. high; surface smooth, glabrous, dry, pallid with a rosy tint, light-bay on the umbo, becoming incrustated on drying with a white, powdery substance readily soluble in water; margin thin, straight, concolorous; lamellae decurrent, few in number, dull-white; spores ovoid, smooth, hyaline, $8-10 \times 5-7 \mu$; stipe curved, cylindric, subequal, glabrous, white, 4 cm. long, 4 mm. thick.

Type collected in rich soil on a wet bank at Chester Vale, Jamaica, 3,000 ft. elevation, December 23, 1908, *W. A. & Edna L. Murrill 298*. The powdery substance covers about one third of the surface and is distributed in radiating patches or streaks.

5. *Clitocybe testaceoflava* sp. nov.

Pileus obconic in outline, deeply umbilicate, irregularly oval in cross section, solitary, 3-5 cm. broad; surface dry, distinctly tomentose, dilute-testaceous, margin irregularly undulate, incurved, concolorous; lamellae decurrent, rather distant, stramineous, edges undulate; spores ellipsoid, smooth, slightly yellowish, $4-5 \times 3 \mu$; stipe cylindric, subequal, curved, slightly paler than the surface of the pileus, white near the base, 3-4 cm. long, 3 mm. thick.

Type collected under low bushes on a bank at Cinchona, Jamaica, 5,000 ft. elevation, December 25-January 8, 1908-9, *W. A. & Edna L. Murrill 543*.

6. *Clitocybe mexicana* sp. nov.

Pileus convex to depressed, irregularly lobed, gregarious, scarcely cespitose, 7 cm. broad; surface smooth, glabrous, nearly white, with an avellaneous-isabelline tint, margin striate, involute when young; context 1 cm. thick at the center, milk-white, sweet, odor none when fresh, but strong and not unpleasant on drying; lamellae decurrent, close, rather narrow, tapering at each end, pale watery-white; spores fusiform, smooth, hyaline, 7μ long; stipe enlarging slightly above, dealbate, glabrous, finely tomentose near the base, hollow, white inside, with a tough rind, 7 cm. long, nearly 2 cm. thick.

Type collected on the ground among humus in a moist virgin forest near Jalapa, Mexico, 5,000 ft. elevation, December 12-20, 1909, *W. A. & Edna L. Murrill 137*.

7. *Clitocybe Broadwayi* sp. nov.

Gregarious to subcespitose, rather large, abundant, strongly suggesting *Tricholoma alboflavidum*, but with distinctly decurrent gills; pileus thin, convex, often indented on the side next to the stipe owing to its clustered arrangement, 5-8 cm. broad; surface glabrous, faintly radiate-striate, dry, white or pale-isabelline, depressed to umbilicate; margin incurved, concolorous, blackening when bruised; lamellae decurrent, close, narrow, white; spores ellipsoid, smooth, hyaline, $5-7 \times 3.5-4.5 \mu$; stipe curved, cylindric, usually equal, glabrous, toughish, slightly reddish-brown, twisted and finely grooved when dry, suggesting asbestos, 5-7 cm. long, 2-4 mm. thick.

Type collected on the ground among leaves in a cocoa plantation at Tanteen, St. George's, Grenada, August 23, 1905, *W. E. Broadway*. Also collected in Grenada by Broadway in September, 1905.

DOUBTFUL AND EXCLUDED SPECIES

Most of these will be found treated under *Monadelphus*, *Omphalia*, and *Marasmius*. *Clitocybe rivulosa*, reported from the West Indies by Fries, is a European plant, and no specimens of it from tropical America have been seen in any of the herbaria examined. *Clitocybe pachylus* Berk. & Curt., from Cuba, is probably undescribed.

3. *MONADELPHUS* Earle, Bull. N. Y. Bot. Garden 5: 432. 1909

This genus was founded by Earle to receive the cespitose species of *Clitocybe*, the type being *C. illudens*.

***Monadelphus caespitosus* (Berk.)**

Lentinus caespitosus Berk. Hook. Lond. Jour. Bot. 6: 317. 1847.

(Type from Ohio.)

Agaricus (Pleurotus) caespitosus Berk. Jour. Linn. Soc. 10: 287. 1868.

Agaricus monadelphus Morgan, Jour. Cinc. Soc. Nat. Hist. 6: 69. 1883. (Type from Ohio.)

Clitocybe monadelphia Sacc. Syll. Fung. 5: 164. 1887.

Pleurotus caespitosus Sacc. Syll. Fung. 5: 352. 1887.

A rather common species in the southern United States, ranging north to New York and west to Kansas. At Kew, it is represented by specimens from South Carolina and Ohio only, those from Cuba bearing this name being an entirely different plant. Fries knew the species well, so we may infer that Liebmann's specimens from Orizaba, Mexico, were correctly determined, although they appear to have been lost. This species has the habit and general form, but neither the brilliant coloring nor the poisonous properties, of *M. illudens*. It is difficult to distinguish from certain forms of *Armillaria mellea*, which also occurs in dense clusters about old stumps but is usually furnished with a veil. The spores of *M. caespitosus* are broadly ovoid, smooth, hyaline, $7 \times 5 \mu$.

Orizaba, Mexico, *Liebmann*; British Honduras, *Morton E. Peck*.

4. MELANOLEUCA Pat. Tax. Hymén. 159. 1900

Tricholoma (Fries) Quél. 1872. Not *Tricholoma* Benth. 1820.

This genus, usually known as *Tricholoma*, is abundantly represented in temperate regions. It differs from *Clitocybe* chiefly in its sinuate or adnexed, instead of decurrent, gills.

1. **Melanoleuca holoporphyra** (Berk. & Curt.)

Agaricus (*Clitocybe*) *holoporphyrus* Berk. & Curt. Jour. Linn. Soc. 10: 284. 1868.

Described from Wright's Cuban collections, and said to grow on rotten logs in woods. The types at Kew have been examined. My own notes, supplemented by a colored drawing, are as follows: "Pileus convex, 6 cm. broad; surface lateritious, dry, finely tomentose, slightly striate on the margin; lamellae sinuate with a decurrent tooth, broad, distant, testaceous; spores ovoid, smooth, hyaline, $9-12 \times 4-7 \mu$; stipe equal, pale-purple, glabrous, hollow, with a fibrous-looking rind, 6×1 cm. Solitary in rich soil in coffee plantations along the Rio Blanco, January 17, 1910."

Xuchiles, Mexico, *W. A. & Edna L. Murrill 1125*.

2. **Melanoleuca dichropus** (Fries)

Agaricus (*Tricholoma*) *dichropus* Fries, Nova Acta Soc. Sci. Upsal. III. 1: 22. 1851.

This beautiful species was collected in the island of St. Thomas by Oersted, who made a colored drawing of it which may still be seen at Copenhagen, but no trace of the fungus itself was discovered either in Denmark or in Sweden. The pileus is represented as dilute wine-colored, with a purple center, and the stipe is concolorous except at the apex, where it abruptly changes to white. The general form of the plant is more like *Lepiota* than *Melanoleuca*.

3. *Melanoleuca jamaicensis* sp. nov.

Pileus umbilicate, solitary, 2-3 cm. broad; surface glabrous, lateritious-fulvous; lamellae sinuate with a decurrent tooth, lateritious, broad, rather distant; spores globose, smooth, hyaline, 3-4 μ ; stipe slender, cylindric, equal, glabrous, concolorous with the surface of the pileus, 4 cm. long, 2.5 mm. thick, the apex much enlarged, 5 mm. thick, stramineous, and tomentose.

Type collected on the ground under tree-ferns at Morce's Gap, Jamaica, 5,000 ft. elevation, December 29, 30, January 2, 1908-9, *W. A. & Edna L. Murrill 720*. The fresh plant has the appearance of *Clitocybe proxima* Boud.

4. *Melanoleuca subisabellina* sp. nov.

Pileus irregular, convex to infundibuliform, gregarious, 4-8 cm. broad; surface glabrous, dull-colored, dingy-isabelline, margin undulate or slightly lobed, inflexed; lamellae sinuate, straight, narrow, rather close, white to dirty-brownish; spores ellipsoid, hyaline, 5 \times 3.5 μ , with minute, short prickles; stipe curved, tapering toward the base, glabrous, fleshy, white, 3 cm. long, 3-10 mm. thick.

Type collected on a waste heap of earth and vegetable refuse in Castleton Gardens, Jamaica, December 14, 15, 1908, *W. A. & Edna L. Murrill 45*.

5. *Melanoleuca jalapensis* sp. nov.

Pileus convex, much split at the margin, solitary, 4 cm. broad; surface dry, glabrous, shining, more or less radiate-rimose, the castaneous cuticle remaining entire at the center, but almost disappearing near the margin, where it persists in faint streaks or patches; context thin, white, sweet; lamellae adnate with a slight sinus, narrow, rather close, cremeous, pruinose under a lens; spores globose, smooth, hyaline, 5 μ ; stipe cylindric, equal, gla-

brous, white, with a tough rind, 4 cm. long, 7 mm. thick, abruptly bulbous at the base as in some species of *Clitocybe* and *Cortinarius*.

Type collected on rich soil in a moist virgin forest near Jalapa, Mexico, December 12-20, 1909, *W. A. & Edna L. Murrill* 85.

DOUBTFUL SPECIES

Agaricus (Tricholoma) sordidus Fries, *Epier. Myc.* 53. 1838. Reported from St. Thomas by Fries in *Nova Acta Soc. Sci. Upsal.* III. 1: 23. 1851, who identified one of Oersted's collections as this species. No trace of the specimens in question were found in Europe.

5. *Hydrocybe* (Fries) Karst. *Hattsv.* 233. 1879

This genus, usually known as *Hygrophorus*, contains many brilliantly colored members in temperate regions, some of the commonest of which were described and illustrated in *MYCOLOGIA* for July, 1910.

1. *Hydrocybe albo-umbonata* sp. nov.

Pileus conic, with long cylindrical umbo, solitary, 2.5 cm. broad, nearly 2 cm. high; surface smooth, glabrous, moist, white; lamellae broad, ventricose, thin, white; spores subglobose, smooth, hyaline, 5-7 μ ; stipe curved, terete, equal, glabrous, moist, white, 5 cm. long, 2 mm. thick.

Type collected on the ground in woods at New Haven Gap, Jamaica, 5,600 ft. elevation, January 4, 1909, *W. A. & Edna L. Murrill* 764.

2. *Hydrocybe aurantia* sp. nov.

Pileus obconic, small, solitary, 1.5 cm. broad; surface smooth or slightly striate, glabrous, dry or moist, aurantiaceous, lamellae adnate, rather broad and distant, subconcolorous; spores globose, smooth, hyaline, 3-5 μ ; stipe slightly tapering downward, glabrous, aurantiaceous, pruinose at the apex, 2.5 cm. long, about 2 mm. thick.

Type collected on the ground in woods at Morce's Gap, Jamaica, 5,000 ft. elevation, December 29, 30, January 2, 1908-9, *W. A. & Edna L. Murrill* 743.

3. **Hydrocybe bella** (Massee)

Hygrophorus bellus Massee, Jour. Bot. 30: 161. 1892.

Type collected on the ground in woods in the Nariaqua Valley, St. Vincent, by W. R. Elliott. A large scarlet species with decurrent gills and immense ellipsoid spores $18 \times 10 \mu$.

4. **Hydrocybe Cantharellus** (Schw.)

Agaricus (Omphalia) Cantharellus Schw. Schr. Nat. Ges. Leipzig, 1: 88. 1822.

Hygrophorus Cantharellus Fries, Epicr. Myc. 329. 1838.

A very pretty little species, resembling *Omphalia* but brilliantly colored, common in many varieties from Maine to Alabama and west to Minnesota. The spores of the tropical specimens are ellipsoid, smooth, hyaline, $8-9 \times 5 \mu$.

Castleton Gardens, Jamaica, Earle 227; New Haven Gap, Jamaica, 5,600 ft. elevation, W. A. & Edna L. Murrill 760.

5. **Hydrocybe Earlei** sp. nov.

Pileus convex, solitary, 3 cm. broad; surface glabrous, silky-shining, not striate, pale reddish-yellow; context yellow, mild; lamellae slightly adnexed, crowded, broad, ventricose, cremeous; spores globose, smooth, hyaline, 7μ ; stipe somewhat flattened, equal, hollow, glabrous, shining, pale-yellow, 5-6 cm. long, 4-6 mm. thick.

Type collected on the ground in a pasture at Herradura, Cuba, June 16, 1907, F. S. Earle 562.

6. **Hydrocybe flavolutea** sp. nov.

Pileus convex, solitary, 1.3 cm. broad, 5 mm. high; surface luteous, with faint traces of red, polished, slightly viscid, radiate-striate; lamellae flavous, slightly ventricose, rather close, several times inserted, apparently free, but really connected by slender threads of tissue across the disk to which the stipe is attached; spores globose, regular, hyaline, uninucleate, smooth, $4-5 \mu$; stipe cylindrical, equal, smooth, glabrous, citrinous, whitish-tomentose and slightly enlarged at the base, 2.2 cm. long, 1.5 mm. thick.

Type collected in soil on a bank at Cinchona, Jamaica, December 25-January 8, 1908-9, W. A. & Edna L. Murrill 527. Also collected at Jalapa, Mexico, December 12-20, 1909, W. A. & Edna L. Murrill 35, 110.

7. *Hydrocybe hondurensis* sp. nov.

Pileus convex to plane, slightly depressed, solitary, 1-1.5 cm. broad; surface luteous, very viscid, radiate-striate; lamellae short-decurrent, rather narrow, inserted; spores ovoid, smooth, hyaline, $5 \times 3.5 \mu$; stipe equal, concolorous, very viscid, 3-4 cm. long, 1-2 mm. thick.

Type collected in rich soil in British Honduras, 1906, *Morton E. Peck*.

8. *Hydrocybe rosea* sp. nov.

Pileus convex with an umbilicate center, resembling *Omphalia* in shape, solitary, 1 cm. broad, 5 mm. high; surface smooth, glabrous, not viscid, roseous to incarnate, margin entire or rarely lobed, decurved; context very thin, allowing the lamellae to show through on the upper side; lamellae decurrent, arcuate, white, stained with red; spores ovoid, smooth, hyaline, $10-13 \times 7-9 \mu$; stipe smooth, cylindrical, paler than the pileus below, deep-red at the apex, where it is much enlarged, 1.5 cm. long, 1 mm. thick below.

Type collected in moss on a decayed log on Sir John Peak, Jamaica, 6,000 ft. elevation, January 5, 1909, *W. A. Murrill 811*.

9. *Hydrocybe subcaespitosa* sp. nov.

Pileus convex to plane or depressed, subcaespitose, 2-3 cm. broad; surface smooth, glabrous, ruber when young, minutous when older; lamellae white to stramineous, adnate or slightly decurrent, broad, inserted; spores oblong-ellipsoid, smooth, hyaline, $8-9 \times 5 \mu$; stipe thick, cylindrical to slightly flattened, smooth, glabrous, luteous or paler yellowish, about 3 cm. long, 5 mm. or more thick.

Type collected on rich soil under tree-ferns at Morce's Gap, Jamaica, 5,000 ft. elevation, December 29, 30, January 2, 1908-9, *W. A. & Edna L. Murrill 750*.

10. *Hydrocybe subflavida* sp. nov.

Pileus conic to subcampanulate, umbonate, gregarious, reaching 5 cm. broad and 3 cm. high; surface pale-flavous, dull-luteous in very young stages and on the umbo, moist, smooth, becoming striate in old or wet specimens; lamellae adnate with decurrent tooth, broad, ventricose, rather distant, pale-yellow; spores globose, smooth, hyaline, 5μ ; stipe cylindrical, equal, pale-flavous, glabrous, 4-5 cm. long, 4-7 mm. thick.

Type collected on the ground under tree-ferns at Morce's Gap, Jamaica, 5,000 ft. elevation, December 29, 30, January 2, 1908-9, *W. A. & Edna L. Murrill 674*.

11. *Hydrocybe subminiata* sp. nov.

Pileus convex to plane, at length irregular, 1.5 cm. broad; surface viscid, smooth, minutous, varying slightly in places, margin undulate; lamellae decurrent, few, whitish to ochraceous; spores oblong-ellipsoid, often constricted at the middle, smooth, hyaline, about $9 \times 5 \mu$; stipe terete, crooked, slightly enlarged above, glabrous, luteous, 3 cm. long, 2 mm. thick.

Type collected in soil on a shaded bank at Chester Vale, Jamaica, 3,000 ft. elevation, December 23, 1908, *W. A. & Edna L. Murrill 369*. Also collected on the ground under tree-ferns at Morce's Gap, Jamaica, December 29, 30, January 2, 1908-9, *W. A. & Edna L. Murrill 672*. What appears to be the same species was collected near Santiago de las Vegas, Cuba, September 11, 1904, *F. S. Earle 181*.

12. *Hydrocybe troyana* sp. nov.

Pileus subhemispheric to convex, solitary, 1-1.5 cm. broad, 3 mm. high; surface smooth, viscid when wet, ferruginous; lamellae decurrent, violaceous, distant, rather broad, two or three times inserted; spores ellipsoid, smooth, hyaline, $7-9 \times 4-5 \mu$; stipe glabrous, cylindric, latericious above, paler below, changing to flavous at the base, 4 cm. long, 2.5 mm. thick.

Collected on the ground in Troy and Tyre, Jamaica, January 12-14, 1909, *W. A. Murrill & W. Harris 1078 (type), 109c*. This is a smaller species than *H. coccineus*, with ferruginous hues on the surface of the pileus and violet-tinted lamellae.

DOUBTFUL SPECIES

Hygrophorus miniatus Fries, *Epicr. Myc.* 330. 1838. This common temperate species has been reported by Duss upon various kinds of dead wood in Guadeloupe.

Hygrophorus? variolosus Fries, *Nova Acta Soc. Sci. Upsal.* III. 1: 29. 1851. Described from collections in Costa Rica by Oersted, who made colored drawings of fresh specimens and also preserved some in alcohol. These specimens could not be found

in Europe, but the drawings strongly suggest *Chamaemyces alphytophyllus*.

6. *HYGROPHORUS* Fries, Gen. Hymen. 8. 1836

Lymacium (Fries) Schröt, Krypt. Fl. Schles. 3¹: 330. 1889.

This genus in its present limitation includes species provided with a veil, which is glutinous and often inconspicuous.

1. *Hygrophorus subpratensis* sp. nov.

Pileus convex, obtuse, gregarious, 3-4 cm. broad; surface pale-fuscos when young, becoming pallid or whitish with darker disk, slimy-viscid, not striate, pellicle separable; context white, unchanging, odor and taste mild; lamellae deeply sinuate, broad, crowded, white; spores globose or subglobose, smooth, hyaline, 5μ ; stipe cylindric, equal, slimy-viscid, white, solid but spongy, 3-4 cm. long, 3-4 mm. thick; veil slimy-viscid, scarcely leaving an annulus.

Type collected on lawns at Santiago de las Vegas, Cuba, June 1, 1905, *F. S. Earle* 373. Also collected on banana trash in the some locality, June 16, 1904, *F. S. Earle* 68.

2. *Hygrophorus montanus* sp. nov.

Pileus plane or convex, smooth, depressed, gregarious, 2.5 cm. broad; surface smooth, viscid, stramineous to isabelline, with a testaceous tint, margin incurved, white, entire; lamellae adnexed, rather broad, yellowish-white, discolored in blotches on drying, pruinose on the edge; spores pip-shaped, smooth, faintly yellowish, $8-10 \times 4-5\mu$; stipe shining, watery-white, smooth, cylindric, equal, fleshy-fibrous, 4 cm. long, 5 mm. thick; veil very slight, not forming an annulus.

Type collected on the ground in a trail at New Haven Gap, Jamaica, 5,600 ft. elevation, January 4, 1909, *W. A. & Edna L. Murrill* 769.